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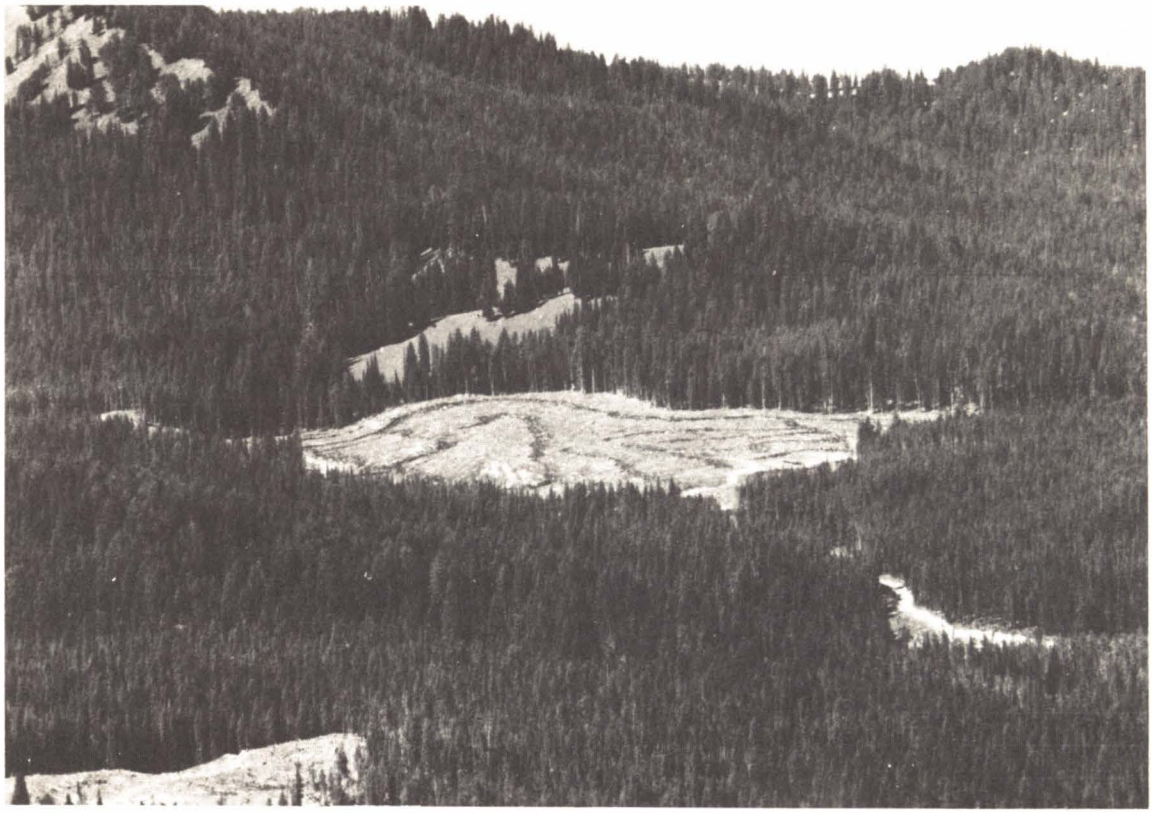
REPORT NO. 6

TIMBER MANAGEMENT FOR A QUALITY ENVIRONMENT



National Forest Management Practices

FOREST SERVICE ● U.S. DEPARTMENT OF AGRICULTURE ● MAY 1971

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CI Report No. 6 is adapted from material in "National Forest Management in a Quality Environment--Timber Productivity," the report of a nationwide review of National Forest timber management by a Forest Service multi-discipline team of staff experts.

INTRODUCTION

The mission of the Forest Service, U. S. Department of Agriculture, is to help meet present and future demands for goods and services from the Nation's forests and related resources. Briefly, the Forest Service has three main responsibilities:

1. To develop, manage, and protect the National Forest System. These public lands include 187 million acres in 154 National Forests, 19 National Grasslands, and other areas located in 44 States and Puerto Rico. Resources on all of these units are managed directly by the Forest Service.

2. To conduct basic and applied research in forestry and related fields. This work is conducted at 80 locations throughout the United States, often in cooperation with university and other research agencies.

3. To cooperate in programs designed to improve the protection, management, and use of forest lands and resources in State and private ownership through technical and financial assistance to State forestry organizations and other cooperators.

These three basic responsibilities are interlocked. Management of the National Forest System, forestry and environmental research, and cooperation in State and Private Forestry programs form an integral unit. Together, they bring Forest Service programs and activities in forestry to bear on one-third of the Nation's surface area.

In 1970 the Forest Service adopted a "Framework For The Future." This set of policy statements and guidelines was published to set forth the broad direction to be followed by the agency. In that context, a Forest Service Environmental Program For The Future is being developed. The program will include goals to improve environmental management and increase the flow of goods and services and benefits from forests and related lands. Strong emphasis is being focused on high quality in management practices and on improved balance among the various Forest Service program responsibilities.

The National Forest System

The National Forests were created at the turn of the century. Even then, people realized that America's lands and forests were not inexhaustible. They knew that a portion of the public lands should be retained and protected to meet the needs of future generations. Many of the forest lands of the East had already been denuded to meet the material needs of a young and robust Nation. The same process was starting in the West. Effective actions by Presidents Benjamin Harrision, Grover Cleveland, and Theodore Roosevelt reserved great masses of land in the West from disposal to private ownership. These reservations were made part of the Forest Reserve System. In 1905, the Forest Service was formed in the Department of Agriculture to administer these public lands and resources as National Forests. Gifford Pinchot, the first native American formally schooled in forestry, was named as the first Chief.

Gifford Pinchot injected the word "conservation" into the common vocabulary as synonymous with the wise use of forest resources. Conservation has been the credo of the Forest Service ever since.

In 1911, the Weeks Law led to purchase of forest lands needed to regulate the flow of navigable streams and to produce timber. Most of the National Forest lands in the East have been acquired under that authority.

Over the course of time, the theme in management of these public lands changed from protection to management as demands upon the resources grew throughout the Nation. Gifford Pinchot sought "working forests," but he could not foresee how far the needs of the American public would require that philosophy to be carried.

From the outset, watershed protection and timber production were primary objectives. But this was only the beginning. Before long, improvement of fish and wildlife habitats, developments to meet outdoor recreation needs, establishment of wilderness-type areas, and control of grazing and mining activities were recognized by many as key aspects of National Forest management. Thus the "working forest" concept expanded to embrace a broad spectrum of uses.

During this evolution the Forest Service has responded to the changing and increasing needs. For example, agency leaders pioneered the wilderness concept in America by establishing the first such designated area in 1924. Municipal watersheds were protected. Cooperative wildlife-habitat-improvement programs were developed with States. Overgrazing has been reduced. Endangered wildlife species were protected. Outdoor recreation opportunities were increased tremendously. Historic areas were identified and protected. Wildfire losses were reduced. Many denuded areas were reforested, and soil erosion was reduced. These and many other responsive actions were carried out within the philosophy of coordinating uses and management practices and assuring sustained yields of goods and services for the benefit of future generations.

In 1960 by the Multiple Use-Sustained Yield Act (16 U.S.C. 528-531), water, wildlife, recreation, range, and timber resources were made co-equal in importance. Today wild and scenic rivers, hiking routes, endangered species of wildlife and plant life, and the appearance of the landscape, share the resource management stage with concerns for timber supply and other "commodity" needs.

What this means is that although timber production must continue to be one of the major purposes of National Forest management, increased attention must be given to other resources, uses, and values. Without question timber from the National Forests, will continue to be a source of one of the most vital raw materials used to meet the needs of a growing Nation.

Similarly, production of forage for cattle and sheep will continue to be an important role for the National Forest System. About 106 million acres produce forage. The importance of food and cover for big game and other forms of wildlife, and habitat for fish, will not diminish. Production of increasing amounts of clean water for agriculture, industry, and domestic use will continue as a major objective. Outdoor recreation is the fastest growing use of the National Forest System—and this trend will continue.

Timber harvesting does not preclude management and use of the forest resource for these other purposes. Some 14,300,000 acres of National Forest land are now managed for wilderness-type purposes. No timber harvesting is done in these areas. Many additional areas are being considered for possible inclusion in the Wilderness System. Another 108 areas, covering some 911,000 acres of National Forest land, have been designated as archeological, historical, botanical, geological, scenic, or natural areas. There are 478 miles of classified wild, scenic, and recreation rivers within the National Forests. Many other streams are being studied as potential additions to that system.

Of the nearly 187 million acres of National Forest System lands, close to half is now classed as being both suitable and available for production of continuous crops of timber.

Although production of timber crops is the subject of this report, other uses and values of the National Forest System must be recognized. In particular, a concern for environmental quality suffuses all the actions contemplated in this report.

The Nation's Wood Needs

A substantial increase in the supply of softwood timber products will be needed—especially to meet housing requirements. This increase can and must be achieved in a manner consistent with preservation and enhancement of the quality of our environment. This is the finding of the Task Force on Softwood Lumber and Plywood as reported by President Nixon in June 1970. Demand is expected to build rapidly after 1971, primarily because of increased housing construction.

The Task Force estimated that the demand for softwood timber, consistent with the achievement of National housing goals, will be about 11 billion board feet higher by 1974 than it was in 1969. After 1974, further increases in total timber demands are likely, even though annual housing starts should level off at about 3 million units.

The National Forests have a sustained yield capacity equal to about 30 percent of the total softwood sawtimber production of the Nation at present management levels. The other 70 percent of production comes mostly from industry and other private holdings. The Task Force estimated that National Forest harvests would need to increase by about 7 billion board feet annually by 1978 if the Nation's needs for housing are to be met. Their report made clear that this projection was judged possible only if certain investments in reforestation, stand improvement, access roads, and related resource needs were made in adequate amounts and on schedule.

These needed investments will provide the additional growth which must precede increases in the allowable harvest. Delays in making necessary investments may well make it impossible for National Forest timber growth to reach the 7 billion board feet increase on the schedule projected by the Task Force.

The situation is further complicated by challenges to plans to harvest timber in areas not yet roaded, or where some people feel such cutting is incompatible with other uses. This sort of challenge and restraint tends to limit the area available for timber harvesting. In fact, it is possible that these impacts may importantly restrict the rate at which additional yields can be achieved.

Of the 187 million acres in the National Forest System, 97 million acres are currently classed as commercial forest land. This forest acreage carries more than half of the softwood sawtimber inventory volume in the whole country. These lands can and should produce continuing crops of timber for housing and a host of other uses.

In fiscal year 1970, more than 13.9 billion board feet of sawtimber was sold from National Forests, and more than 11.7 billion board feet was harvested. The "annual allowable cut" on the National Forests now is 13.74 billion board feet. This is the level of cutting established in current timber-management plans. Timber-volume data presented in this report are International 1/4-inch rule. Allowable-cut data presented here do not include several million cords of smaller timber available for pulpwood or miscellaneous products.

Logging is carried out by private companies under contract with the Forest Service. The sales are administered by the Forest Service; with minor exceptions, sale contracts result from competitive bidding on a sale-by-sale basis.

Receipts from sales of timber (along with other National Forest System receipts) go into the Federal Treasury, with two exceptions. Ten percent is appropriated annually for building National Forest roads and trails in the States where the funds originated. Another portion (usually 25 percent) is returned to the States for distribution among counties, in proportion to the acreage of National Forest in each county, to be used for roads and schools.

None of the National Forest receipts can be used to finance the cost of preparing timber sales, selling timber, or administering sale contracts. Such activities must be financed with Congressional appropriations. Under the law (Knutson-Vandenberg Act, 16 U.S.C. 576), purchasers may be required to make deposits for reforestation and timber-stand improvement. These deposits must be used on sale areas. In fiscal year 1969, these deposits amounted to $29.5 million. Money to finance these activities outside of sale areas must be appropriated for that purpose by the Congress.

Timber harvests from National Forests are very important in the Nation's economy. Sales of standing trees total more than a quarter billion dollars each year. Timber produced from these lands is the raw material base for more than a million jobs. These harvests generate an estimated $15 billion to the Nation's Gross National Product.

Some parts of this harvesting process are causing public concern in some situations. For example, even-aged management requires that there be at some stage a final harvest cut, sometimes including clearcutting, to remove the mature timber. These concentrated

harvest cuts are one stage in a series of actions necessary to assure regeneration of a vigorous and healthy forest in certain timber types. Some species or stand conditions require this kind of treatment if the forest is to be reestablished and remain productive.

Of course, establishment of a new forest after harvest cutting is necessary for protecting the soils and other forest values and uses--as well as for sustaining production of timber crops.

Road construction is another cause of public concern about timber harvesting on the National Forests. If forests are to be managed and used and regenerated, roads must be built. But unless the roads are planned and built properly, they can adversely affect the forest resources and harm the forest environment. Road fills can slide and erode, and streams can become laden with road silt and debris. The forest landscape can be scarred by poor road location, design, and construction.

The Forest Service shares these concerns. Actions are needed to more effectively integrate necessary timber harvesting and road building into the total range of National Forest resource management. Watershed, recreation, wildlife habitat, and esthetic values in particular are involved. Silvicultural practices, including regeneration measures, have significance far beyond timber production. The road network established in the forest is essential for many activities other than moving logs.

Actions Now Under Way to More Directly Recognize Environmental Problems

Steps are being taken now to improve National Forest administration. Some of those pertinent to timber management and related activities are:

1. A major effort is under way to develop a Servicewide multifunctional program-planning process--including public involvement. Many disciplines and points of view are being brought together, especially at the planning stage. The purpose is to overcome functional or single-interest approaches to resource management planning. The team approach should reduce the possibility of overlooking any significant ecological or environmental considerations.

2. An inter-disciplinary approach to planning and management will require more experts of many kinds. The Service now employs people representing more than 80 different professions. Even this range is not adequate for the "Environmental Decade" in either range or numbers. The Service is moving as rapidly as possible to round out the disciplines and increase the number of experts needed on the Forest Service team. From 1965 to 1970 the total number of permanent full-time employees rose only 6 percent; and the number of foresters dropped 3 percent. But, there were dramatic increases in the number of "environmental" professionals employed. For example, the number of landscape architects increased from 109 to 161; soil scientists from 84 to 124; geologists from 19 to 32; plant physiologists from 21 to 37; hydrologists from 4 to 74; fish and wildlife biologists from 14 to 107; and entomologists from 139 to 157. Similar changes are projected for the next 5-year period. In addition, other professions, such as those representing the social sciences, are becoming parts of planning teams and managerial groups.

3. Studies are under way to examine ways to reorganize National Forests to assure a multi-discipline team approach to resource management. Selected National Forests are now being restructured to test various organizational patterns designed to promote coordination in meeting environmental needs. For example, new staff groupings are being oriented toward planning, resource management, engineering, and administration rather than toward the traditional functional fields of timber management, recreation, fire control, and so on.

4. A start has been made to redefine the mission of timber-management functions, to strengthen multiple-use aspects, and to reflect emerging concerns for environmental quality. This is expected to lead to departures from past concepts that tended to limit silviculture and other timber-related activities to the conventional aspects of timber production. Clearly, timber-management activities need to be "designed" to enhance multiple-use rather than to be "modified" for that purpose as in the past.

5. The Forest Service has engaged three Universities to help develop a National Forest transportation planning system and to train people to use it. This system will provide guidelines for determining road standards, as well as the optimum road network for forest-resource development and use. Many analytical tools have been developed and will be evaluated. Pilot testing of the system will be done as soon as possible.

Silvicultural Aspects of Timber Harvesting

Resource management in the National Forests is becoming a matter of keen interest to many people. Forest culture and treatment of these lands is being discussed more and more by legislators, environmentalists, and interested laymen. Many complex issues are involved in meeting the objective of sustained yields of forest goods and services and a high level of coordination among the multiple uses of the National Forests.

Silviculture is particularly complex. For example, in managing any National Forest, several silvicultural systems are customarily in use simultaneously. On-the-ground, tract-by-tract considerations of species, site, and stand conditions; regeneration and growth; protection from wildfire, insects, and diseases; management of soil, water, wildlife habitat and landscapes; and many other factors combine into many variations.

Silvicultural prescriptions do not lend themselves to a "cookbook" approach. Minor variations in any of the many factors involved can create unforeseeable problems. Through years of experience it has been found that what "works" in one case may not be successful in an apparently identical situation. The timing of rainfall, a buildup in the rodent population, a late frost, an insect defoliation, or some other unpredictable event, for example, can thwart an excellent reforestation program.

A sustained yield of forest products is sought by regulating timber harvests on each management unit, such as a National Forest or major portion thereof. Control is attained by rate of cutting, not by selection of the silvicultural system to be used. Typically a mixture of silvicultural systems are in use. Harvests from a variety of sale areas, including clearcutting for example, are combined and regulated within the sustained-yield allowable cut for the management unit, such as a National Forest.

Coordination of timber harvests with other National Forest uses and values is sought through multiple-use plans. These plans have a direct influence on volumes to be removed, cultural treatments, and other management practices.

Silvicultural systems are processes whereby forests are tended, harvested, and replaced to attain specific management objectives. Most systems require a sequence of treatments that must be performed correctly and on schedule.

Harvesting Practices

The following brief discussion of silvicultural systems will help the reader understand some of the differences with which this report deals:

1. Group, Patch, Stand, or Strip Clearcutting. These are forms of even-aged management that remove from an area all the mature and overmature merchantable timber in one cut. The harvested area is then prepared for regeneration, which may be either natural or artificial. There are several reasons for clearcutting. The inability of some species to regenerate and grow in the shade of other trees or in competition with other species often requires clearcutting in one form or another. For example, black walnut, black cherry, yellow-poplar, aspen, birch, Douglas-fir, lodgepole pine, and most other conifers are favored by clearcutting. Conversion of existing forest stands to genetically improved stands for timber and other purposes depends on clearcutting.

   Disease infection in mature and overmature forests often requires clearcutting to remove sources that would infect young trees in the new forest. Dwarf mistletoe disease is an example.

   Some species are shallow-rooted and grow in areas subject to strong winds. Disastrous results often follow attempts to use other than clearcutting systems in such areas. The trees left blow down and become hosts for insects and a wildfire hazard—twin threats of widespread damage to remaining forests.

   Stands of many species, such as the hemlocks and true firs, cannot be partially cut without causing residual trees to be attacked by wood-destroying fungi. Unavoidable wounds on residual trees are infection points for fungus spores that are constantly windborne in the forest.

   Many of the magnificent old-growth forests in the West exist today because wildfires long ago were followed by natural reseeding. This was Nature's method of clearing the land and regenerating the forests.

2. Shelterwood and Seed Tree Cutting. The shelterwood system involves removal of the mature stand in a series of two or more steps that assure natural regeneration of a new stand under the cover of a partial forest canopy. A final harvest removes the shelterwood and releases the young trees to develop in the open as an even-aged forest.

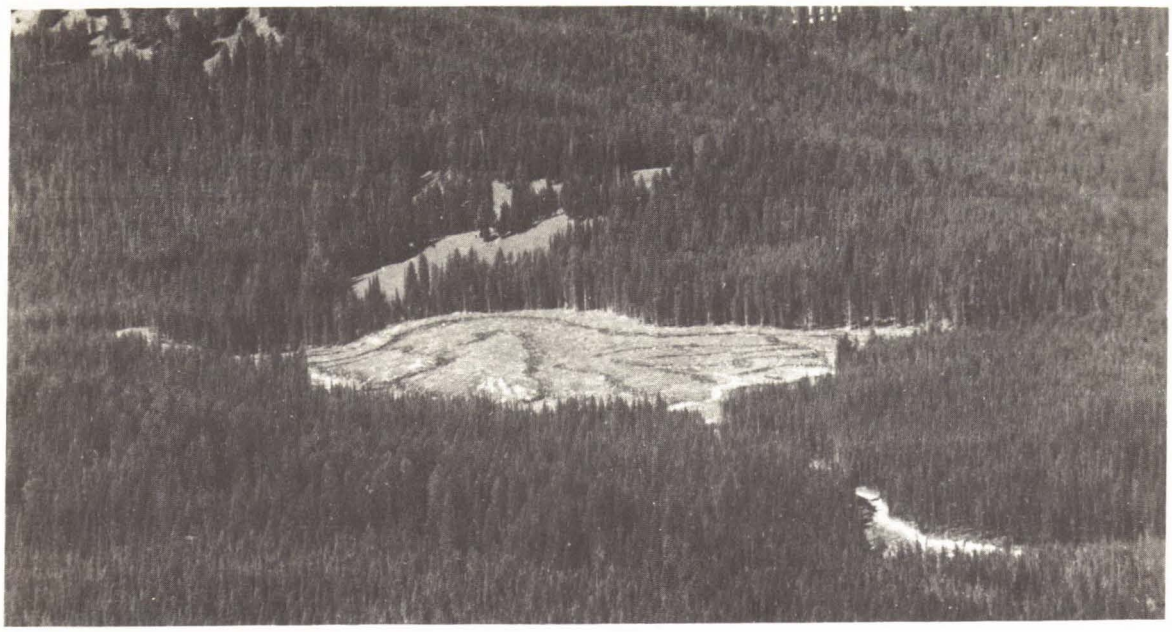
   The seed-tree system is similar. Nearly all the merchantable timber is removed, usually in one operation, leaving a few of the better trees of desired species adequately distributed to reseed the area naturally. A final cut removes the seed trees when the new stand is established.

3. Selection Cutting. This involves the removal of mature trees either singly or in small groups at intervals of time, permitting continuous establishment of regeneration. This results in an uneven-aged stand, having trees of different ages and sizes intermingled, either as single trees or by groups.

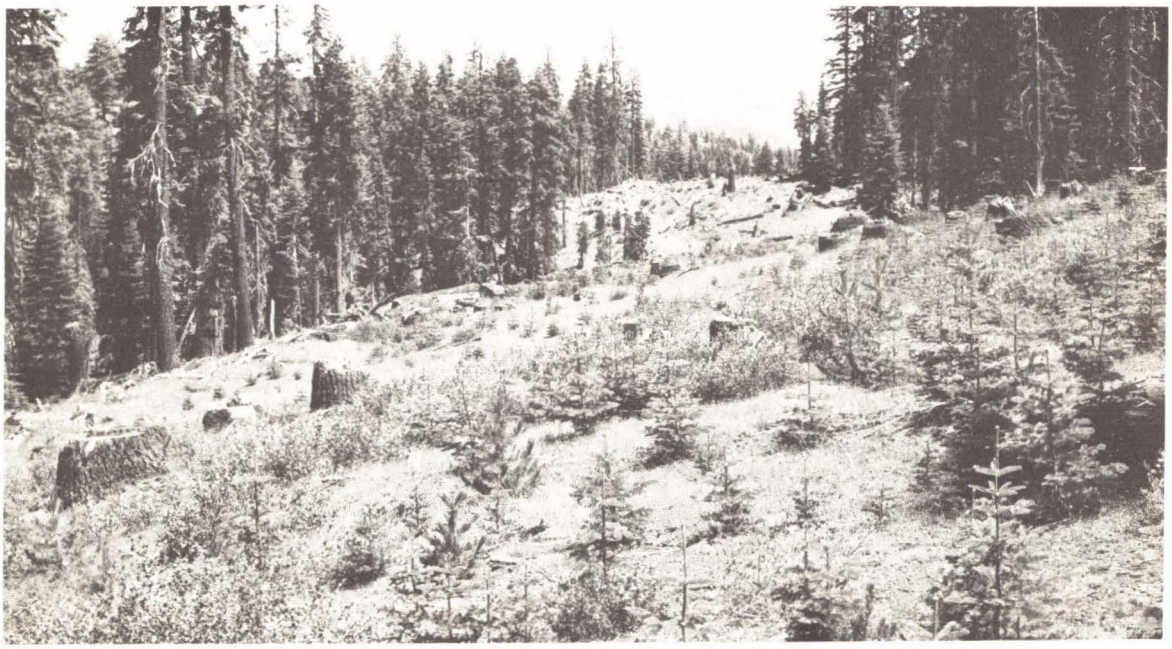
4. Intermediate Cutting. Trees may also be removed periodically for commercial use during the life of a stand. This is done to reduce crowding and stimulate growth (thinning); and to improve the species composition and quality of the remaining stand (improvement cutting). The amount of intermediate cutting in the National Forests should be increased to improve timber productivity. Lack of access roads and markets for these smaller trees are limiting factors in many areas.

   Intermediate cuts are sometimes needed to overcome growth stagnation or to release trees from competition of other vegetation even when a commercial operation is not feasible. Ideally, several intermediate cuts should be made at intervals before the final harvest cut.

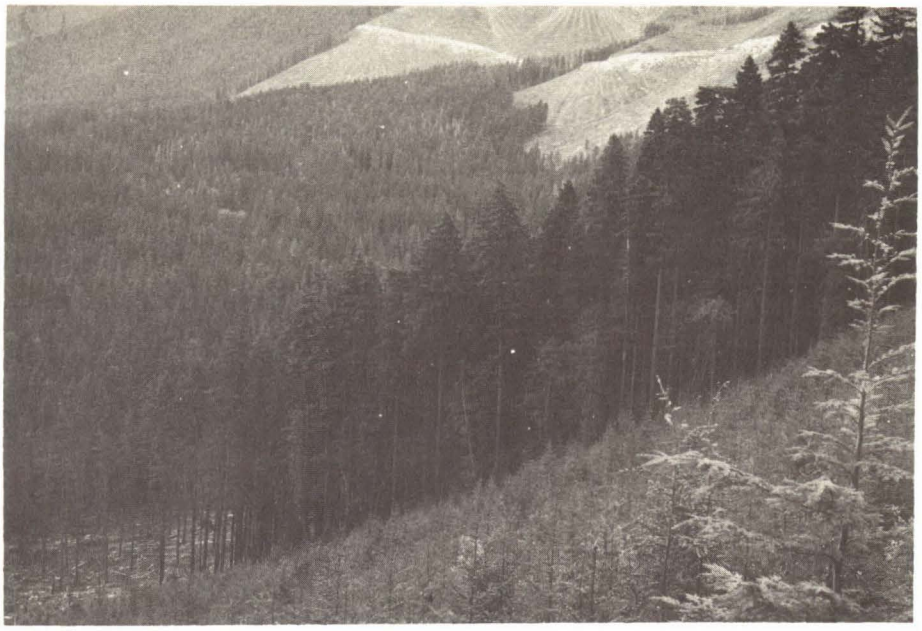
5. Salvage cutting. Much dead or damaged timber is salvaged for commercial use. Damage is caused by fires, insects, diseases, winds, and floods. Salvage cutting takes the form of clear-cutting or partial cutting, depending upon whether the damage occurs in concentrated areas or in scattered single trees or small groups of trees.



CLEARCUT PATCHES. An example in a western National Forest. Attention has been given to size, shape, and spacing of cutting units to minimize adverse impact on landscape appearance. The two upper openings are natural; the lower ones are clearcuttings. Logging slash in the clearcutting in center has been machine-piled into rows for burning to reduce the fire hazard and to prepare the site for regeneration.



CLEARCUTTING IN STRIPS. An example of strip clearcutting in the true fir type in California. Timber like this is not suited to selection cutting because of stand decadence and the possibility of understory infection by dwarf mistletoe After the young trees in the clearcut strip grow to seed-bearing age, the adjacent old-growth trees can be clearcut in strips.



CLEARCUTTINGS AND SHELTERWOOD. Different kinds of cuttings are contiguous in this Pacific Northwest forest. In foreground is an area clearcut 18 years ago, now supporting excellent reproduction of Douglas-fir, western white pine, western redcedar, and noble fir. The area at lower left has received a shelterwood cutting. Big clearcuttings at top right are the result of a 1,000-acre fire in 1967. Fifty million board feet were salvaged.

SHELTERWOOD CUTTING. An example in the Pacific Northwest. Enough trees have been harvested so that shade-intolerant Douglas-fir will regenerate itself, but enough trees have been left to provide a seed source and to protect seedlings from frost, which frequently is fatal to young seedlings. Logging residue has not yet been treated. After treatment and seedling establishment, the shelterwood trees will be removed. This system is being used increasingly in forest types where it is biologically and otherwise feasible.

NECESSITY OF CLEARCUTTING. In this lodgepole pine forest in the West, a strip of old-growth was clearcut to prevent the spread of mistletoe from the old trees to young ones nearby. Disposal of logging slash has not been completed. After the cleared strip has been regenerated, the sequence will be repeated.

SEED-TREE CUTTING. This seed-tree cutting was made in a mature stand of loblolly pine in South Carolina. Sawtimber and pulpwood were harvested.

SELECTION CUTTING. The mixed conifer forest in the Sierra Nevada often has a stand structure that permits selection cutting and all-aged management. This system is particularly feasible in accessible stands of this forest type along travel routes.

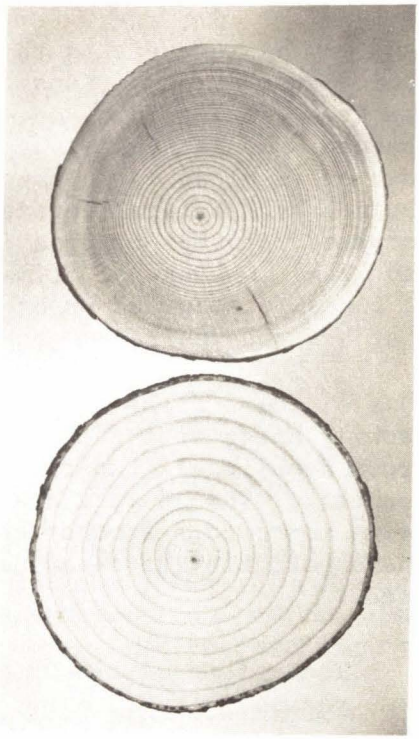
SELECTION FOREST BEING FORMED. Three harvests have been made in this Lake States northern hardwoods stand to develop an uneven-age structure. Another cutting is planned in about 15 years.

GROUP CUTTING. Mixed forests of pine and true fir in California often have a group structure, which permits an attractive group type of silviculture in later harvests.

INTERMEDIATE CUTTING. An example in a young stand of Douglas-fir in the Pacific Northwest. Excess trees are being removed in a commercial thinning. Potential losses are being captured for industrial use, and growth of the remaining trees will be accelerated. The remaining trees will be clearcut sometime in the future, and a few forest will be regenerated.

PRECOMMERCIAL THINNING. The lodgepole pine reproduction in the foreground was precommercially thinned at about 10 years of age, when the expense was not great and the amount of slash was manageable.

GROWTH RESPONSE. Proper spacing enables lodgepole pine to grow rapidly. The section at top is from an 105-year-old tree that grew in an overcrowded stand. The section at bottom is from a 17-year-old tree that was established in an opening created by timber cutting. Both trees were from the same area in Montana.



The percentages of the total area cut over and of the volume removed on the National Forests in 1969 by the previously discussed categories are:

	Eastern forests		Western forests	
	Area cut	Volume produced	Area cut	Volume produced
1. Group, patch, stand, or strip clearcutting	39.6	50.2	30.1	60.8
2. Shelterwood & seed tree				
a. Preparatory	3.6	6.4	16.7	7.0
b. Removal	6.2	8.2	30.2	21.7
3. Selection	2.5	1.3	5.9	1.3
4. Intermediate	48.1	33.9	17.1	8.4
5. Salvage	--	--	--	0.8*
	100.0	100.0	100.0	100.0

Regeneration and Stand Improvement

Land may be regenerated to trees in many different ways. The choice depends on various circumstances and the characteristics of the tree species involved. Most regeneration is obtained by "natural" means; that is, by the germination of seed that falls onto or is blown to the seedbed from trees of seed-bearing age that are nearby. Natural regeneration is often the least costly compared to other alternatives. However, it can be time-consuming and risky, because of climatic factors, seed-crop failures, loss of the site to grass or brush, or regeneration of tree species that are not desired on the site.

Some of these risks can be overcome or reduced by direct seeding (sowing seeds from the air or by hand) or by planting of nursery-grown seedlings. Experience has shown that planting is more successful than direct seeding, although seeding techniques are being improved. Another benefit of direct seeding or planting is the opportunity to establish new forests from genetically improved seed.

*The volume of timber salvaged is a much larger percentage in some years.

Advance site preparation is often necessary to assure successful reforestation—naturally or by direct seeding or planting. Site preparation frees the area of competing vegetation and exposes a suitable seedbed or planting site. In addition, new forests often need periodic cultural treatments as well as protection from wildfire, diseases, and insects.

Hardwood species have the ability to sprout from the root collars of stumps, as well as to reproduce from seed. Sprouts can often be relied upon to regenerate new forests—often so profusely that thinning of the young stand is required. Only a few conifers will produce sprouts; redwood is a notable example.

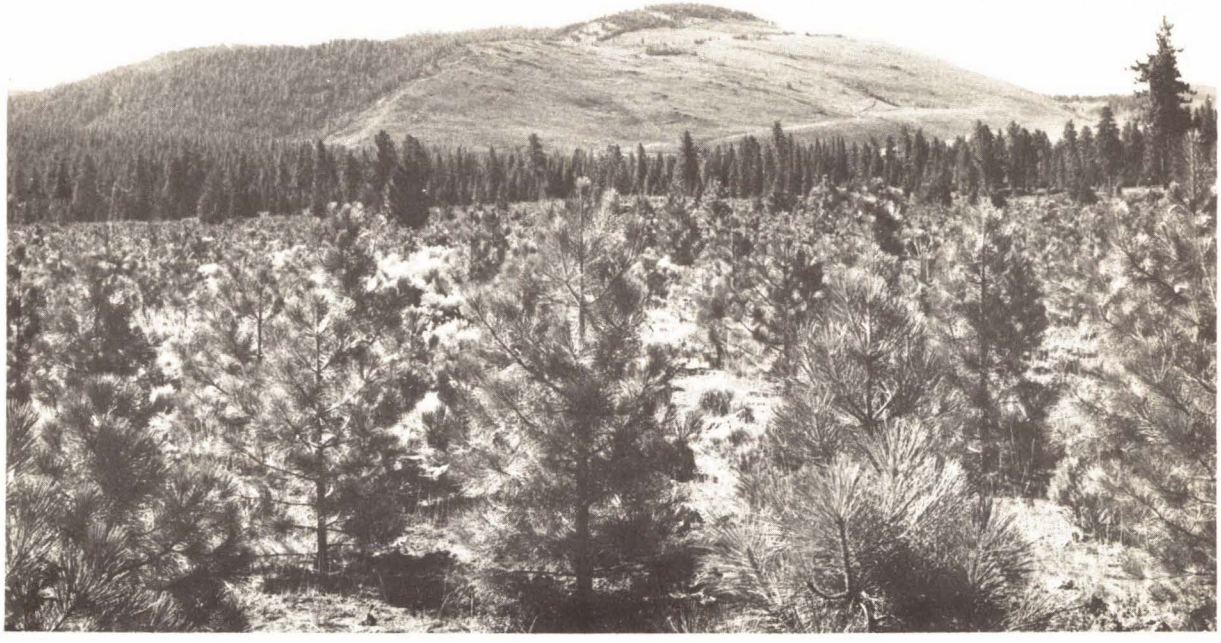
In the National Forest System there are two broad categories of cultural needs—regeneration and timber-stand improvement. There is an accumulated backlog of lands needing regeneration that have resulted mainly from catastrophic fires and pest epidemics. Part of the backlog dates back to the deforested condition of some lands acquired for National Forest purposes. An estimated 4.8 million acres should be reforested. Most of it must be planted or direct-seeded because natural seed sources are absent. Much of this acreage now supports a heavy cover of brush. Site preparation and stand establishment will be costly. As timber is harvested, additional reforestation needs are generated. Although it is desirable to reduce the backlog (and progress is being made), current cutover areas are given priority in programming regeneration efforts.

A large backlog of cultural work also exists on the National Forests. Treatments are needed to stimulate growth, improve species composition, increase timber quality, make better use of growing space, and otherwise increase timber production. Two treatments are especially important: thinning and release.

Stands of young trees are so overstocked in some situations that growth is only a fraction of the potential. Stagnation occurs, and the forest is so dense that the site is of little use for any purpose. Thinning to reduce the number of stems gives dramatic results as the stand is opened up. Done on a selective basis, thinning can also upgrade the composition and quality of the stand by removing the least desirable individual stems. The backlog of needed thinning work is estimated to be 9.1 million acres.

Frequently a young stand is overtopped by vegetation that inhibits growth and prevents development of a productive forest. Operations to remove the overstory, or other competing vegetation, can also produce dramatic results as individual trees are released and become free to grow. A backlog of about 4.3 million acres of understory needs this type of cultural treatment according to current estimates.

GOOD REPRODUCTION. Six-year-old natural reproduction of ponderosa pine after clearcutting in California. After the harvest by clearcutting, the logging residue was machine-piled and burned.



BRUSHFIELD PLANTATION. This successful pine plantation in a western National Forest is 9 years old. Signs along a nature walk tell of the treatment given and the additional reforestation under way on the mountain in the background. The deforested area resulted from a forest fire years ago and is now being given brush-control treatment to prepare it for planting.

NEW FOREST GROWING. This patch in an old-growth Douglas-fir stand was harvested and then planted to the same species. Now it supports a healthy 15-year-old stand. The more recent clearing in the background will soon be covered with young trees. The pattern will be repeated in the adjacent mature timber.

BROWSE AND FLOWERS. After clearcutting in the oak type in the Central States, wildlife browse and flowers become abundant, along with young trees that will grow to form a new forest.

The level of the National Forest regeneration and related stand improvement effort has gradually increased over the years. In fiscal year 1969 the following work was done:

	Backlog Reduction (acres)	Planting Current Sale Areas (acres)	Total (acres)
Reforestation:			
Planted	85,553	118,272	203,825
Seeded	28,801	23,919	52,720
Natural regeneration on prepared sites	11,136	32,732	43,868
Total	125,490	174,923	300,413
Timber-Stand Improvement:			
Release	74,147	102,215	176,362
Thinning	52,894	87,110	140,004
Total	127,041	189,325	316,366

QUESTIONS AND ANSWERS

Q. Is Multiple Use-Sustained Yield being ignored on the National Forests in favor of "dominant use?"

A. Multiple use has been the guiding principle behind Forest Service land management policies since the agency was established. Multiple use means that the various renewable resources on the National Forests can be harmoniously managed and utilized together to provide a continuous supply of goods and services now and in the future. This principle was formalized by Congress with the passage of the Multiple Use-Sustained-Yield Act of 1960 which recognized recreation, forage, water, wood, and wildlife as multiple use resources found on the National Forests. The Forest Service does not characterize any part of multiple use management as dominant use. However, the Law itself recognizes ".... some land will be used for less than all of the resources...." It recognizes that while most uses of the National Forests are compatible, some are incompatible. For instance, the same acres of forest land cannot support wilderness and timber harvesting. However, an acre of forest land from which the timber has been harvested can furnish water, food for cattle, or game, recreation vistas, berry picking, hunting, and access to and through the National Forests.

It has been charged that the Forest Service is not performing multiple use management in conformance with the law. We do not agree. We have made some errors but these have been errors of oversight rather than errors of intent. We are attempting to improve those areas where problems have arisen. In addition, the Forest Service is preparing an "Environmental Program for the Seventies" which will enable us to carry out a balanced program of resource management.

Q. Is the management of the Bitterroot National Forest in Montana, which is being described by some of the public as a "horrible example," typical of management on all 154 National Forests?

A. Some of the allegations about timber management on the Bitterroot National Forest are based on how people feel about timber harvesting; others are based on facts related to the physical resource. Several of the factual problems have been identified in recent studies, and corrective efforts are underway. In one way or another, most National Forests are reviewing their management practices to assure consideration of environmental values. The Forest Service increasingly considers how people "feel" about timber harvesting. It has only been recently

apparent that very many of the public knew or cared about timber harvesting and it is gratifying to find that more people are becoming aware of and interested in the National Forests. It is unfortunate that some of this awareness had to be caused by what are referred to as "horrible examples." There are many good examples of timber and other management practices on all the National Forests. We are confident that the increasing public interest will help the Forest Service achieve the means of carrying out quality management on each of the 154 National Forests.

Q. Is it true the Forest Service intends to increase cut on the National Forests by as much as 60 percent in disregard of the principles of sustained-yield?

A. The idea of a 60 percent increase in timber harvest on the National Forests has been derived from misinterpretation of the President's statement in releasing the Report of the Task Force on Softwood Lumber and Plywood in June 1970. The President directed that "the Secretaries of Agriculture and Interior should formulate plans to improve the level and quality of management of forest lands under their jurisdiction in order to permit increased harvest of softwood timber consistent with sustained-yield, environmental quality and multiple use objectives...." We do not interpret the President's statement as an order to increase timber harvest on the National Forests beyond the amount which can be harvested under the principle of sustained yield. The Forest Service has consistently maintained that it will not do so. National Forest land is capable of producing an increased volume of forest products if funds are made available for intensified forest management practices, including reforestation and timber stand thinning. The Forest Service has estimated different levels of harvest potential increases which could be realized in the future, based on accelerated rates of forest management investments. As noted, however, arbitrary harvest increases not based on growth potential will be avoided.

Q. The Forest Service bases its need to increase timber harvest on the National Forests on the Nation's need for lumber to meet its housing goals of 2.6 million new dwellings per year in this decade. As yet, this goal has not been reached, and indications are that it will not be. How, then, can the Forest Service justify an increased need for timber harvest?

A. Housing starts have been low for the past two years because of tight money markets. Because the goals affirmed in the Housing Act of 1968 have not yet been met does not mean that they should not or will not be. As the economy in general picks up, the housing market will also. Projections indicate that as many as 1.4 million new households will be formed per year in the mid-1970's. If the housing needs of the Nation are to be fulfilled, supplies of softwood lumber and plywood must be available at reasonable costs. Investments made now in intensive forestry will help avert a serious future wood shortage and sustain for a longer period of time the supply of building materials obtained from nonrenewable resources.

Q. What are the possibilities of using substitute materials in construction in place of lumber?

A. Wood substitutes are available at present and can be increasingly utilized for housing construction. The Forest Service supports the Nation's efforts to increase research into wood substitutes and the recycling of wood and paper products. However, it should be remembered that most substitutes--steel, aluminum, glass, plastic, and concrete, for example--unlike wood are derived from non-renewable resources. Once these resources are used, they cannot be replaced. In addition, obtaining the raw materials for substitutes is generally more destructive to the environment than timber harvesting; repairing the damage to the environment is far more difficult. Another consideration in the extensive utilization of wood substitutes in housing construction is present limitations in building codes.

Q. If timber is in short supply, why is so much left in the woods after a timber sale?

A. Economically disposing of wood residues after timber harvest has been one of the most perplexing problems faced by Forest Service research. The timber left on the ground is nonmerchantable because it is either decayed or too small to be utilized as lumber or other products. However, great progress has been made in recent years in minimizing and reducing wood waste. Both technology and economics are merging at a point where in some parts of the country virtually no logging debris is left in the woods. We are encouraged by the continued progress in reducing wood residues left after logging. Another advantage of this progress is reduction of air pollution previously caused by the burning of waste wood in order to reduce forest fire risk and development of tree destroying insect epidemics.

Q. We understand the Forest Service is moving to "multi-discipline" management of the National Forests. Could you explain what is meant by this concept?

A. On a pilot basis, certain National Forests are being reorganized to assure a multi-discipline team approach to resource management. This means that the staff is being grouped in teams along the lines of planning, resource management, engineering, and administration, rather than along the traditional functional fields of timber management, recreation, fire control, etc.

In addition, a major effort is underway to develop a servicewide multi-functional program-planning process to bring many disciplines and points of view together, especially at the planning stage. On both the Forest and the Servicewide level, the idea is to overcome single-interest approaches to resource management and to reduce the possibility of overlooking any significant ecological environmental considerations.

Q. If the National Forests are public lands, why isn't the public allowed to participate in management decisions on these lands?

A. For almost 70 years the Forest Service has tried through conservation education, advisory committees and other means to get the public interested in the conservation of the Nation's natural resources. It is gratifying today to see the national concern on environmental quality and the desire of many people to become "involved" in public land management decisions. In January 1971, the Forest Service adopted a public involvement program entitled, "Public Involvement in Decision Making" which takes advantage of the opportunities provided by this concern for the Forest Service to obtain greater public involvement in its decision-making processes. Its statement of objectives and policy guides issued as "Framework for the Future" identified increased public involvement as one of the eleven major objectives of the Forest Service. The Forest Service believes that a greater degree of constructive public involvement will enable it to do its job better and with greater sensitivity and responsiveness than has been possible in the past.

Q. Why does the Forest Service insist on proceeding with roading and harvesting in so-called "de facto" wilderness areas?

A. The Forest Service does not "insist" upon roading and harvesting in so-called "de facto" wilderness. On the contrary, it is making a special effort to identify those areas on National Forests which still should be studied for potential wilderness classification. When identified, these areas are protected to preserve their wilderness potential during the study period and until a final determination is made. It must be recognized that the Wilderness Act of 1964 specified that 34 existing Primitive Areas in National Forests were to be reviewed first for suitability for addition to the Wilderness System. These reviews were to be finished by September 3, 1974. The Forest Service has had to give priority to studying these areas before it could turn to "de facto" areas. When such areas are selected for study the forest resources are removed from the allowable cut base and placed in a "deferred" status pending outcome of the study.

Q. What is the reason for frequent rotation of professional National Forest personnel, often resulting in the land manager being unfamiliar with the land he is supposed to manage?

A. The National Forest System in its 187 million acres contains a wide variety of forest and related lands, all of which have different management problems and needs. The Forest Service believes that young forest officers should be exposed to a variety of these land management situations to give them experience with a wide range of Forest Service activities and responsibilities.

Thus, as they climb the career ladder to fill the Regional and National Forest Service positions they will have obtained the knowledge and confidence necessary for wise management of the National Forests. However, we do not believe personnel are rotated so frequently as to cause land management problems. On the contrary, the administrator of a Forest can do a better land management job through knowledge of the broad national picture rather than only a specialized or local one.

Q. What is clearcutting?

A. Clearcutting or "clearcut logging" is one method of timber harvest used in even-age management of a forest. In clearcutting, all merchantable timber, regardless of size is removed from an area in one cut. Clearcutting is not the only logging system used. Different systems are used throughout a National Forest, depending on the on-the-ground circumstances.

Q. Is clearcutting practiced on the National Forests because of demands by the timber industry or because it is cheaper for the Forest Service?

A. No. Clearcutting is practiced on the National Forests, where appropriate, because it has been scientifically proven to be the best method of timber harvest for specific situations. Clearcutting is a timber management tool used for specified results, as for example, regeneration of a particular tree species. Although clearcutting may appear to be more economical for the timber harvester, this is not necessarily the case. In clearcut logging, the harvester must remove all merchantable timber from an area, not just high quality timber as in high-grade selective logging.

While the decision to harvest timber by clearcutting is usually based on biologic needs, on occasion the Forest Service has designated clearcutting harvest systems where a suitable alternative may have existed. Pressures to sell timber in the face of limited funds and manpower can contribute to this choice between alternatives. The Forest Service draft "Program for the 70's" recognizes the need for program balance including the proper choice of timber harvesting systems.

Q. What are the scientific reasons for clearcutting?

A. Clearcut logging is used primarily to ensure the regeneration of certain tree species. For example, some trees such as Douglas-fir will not regenerate and grow in the shade of other trees. In other cases, high quality trees are not able to compete successfully with faster-growing weed trees. Conversion of existing forest stands to genetically improved stands depends on clearcutting. And clearcutting is often necessary to prevent the spread of forest insects and diseases by clearing away all sources of infection.

For thousands of years Nature has "clearcut" and renewed forests through fire, windstorms and floods. Timber harvest by clearcutting is a substitute for Nature's cycle of forest harvest and renewal with added benefits going to Man in the form of wood products.

Q. What steps are being taken to ensure clearcutting will not spoil the esthetic qualities of the National Forests?

A. The Forest Service realizes the visual aspects of clearcutting are highly displeasing to a great many people. Accordingly, it is taking steps to modify the appearance of clearcut areas. It is employing its ever-growing staff of landscape architects, 160 at present, to design clearcuts which will blend naturally into the forest landscape. Shapes and sizes of clearcuts will be varied to make them less visually offensive. Clearcuts will be dispersed throughout a forest as much as possible.

Q. Is it true that timber yield cannot be sustained beyond 1 to 4 clearcut cycles because the soils of our National Forests will be so depleted that merchantable timber will not be able to grow.

A. We do not believe this will happen. Our scientists recently analyzed nutrient data from 10 experimental areas in the United States--three in the East and seven in the West. This currently available information indicates no important depletion of forest nutrient reserve caused by timber removal. Nutrient outflows following timber removal are small compared to total nutrients in the soil. In general, nutrient losses appear to be less in the West. Studies by the University of Washington have indicated that changing forest conditions by fertilizing, cutting, or burning has not resulted in any marked change in the leaching of elements out of a western Washington ecosystem.

Centuries of experience in Japan and Germany show no site degradation from repeated even-aged cropping of forests, where proper management was used. Agricultural experience also indicates the ability of managed soils to maintain crop productivity and to be improved if depleted of nutrients and organic matter.

Although additional water quality and nutrient outflow data are being collected on at least 12 Forest Service experimental watershed areas, plus other university study areas, we recognize that not all timber and soil conditions have been studied. Very long-term, carefully planned research is needed to show the nutrient regime in managed forest stands over a wide range of conditions and to determine if areas of marginal nutrient supplies exist.

Q. A bill has been introduced into the United States Senate which would impose a two-year moratorium on clearcutting in the National Forests. What would be the effect of such a moratorium?

A. A suspension of clearcutting on the National Forests at this time would have a very serious effect upon the Nation's housing program and upon the national economy. Clearcutting is used on about one-third of the acreage cut over on the National Forests and produces about 60 percent of the harvest volume. It is estimated that suspension of clearcutting would reduce the volume of sales on the National Forests during the two years to below 4 billion board feet--from an allowable cut of 11.5 billion board feet. The uncertainity of timber supply and the drop in sales

volumes would cause mill closures and sky-rocketing lumber and plywood prices. In the Pacific Northwest where as much as 50 percent of the local economy is timber-based, a major economic crisis would result. Nationally, housing programs, home builders, home buyers and associated housing-oriented businesses and individuals would face disaster.

Experience has shown that it is biologically disastrous to substitute selective cutting on areas where the proper silvicultural system is clearcutting. Therefore, it should not be expected that present levels of timber harvest could be maintained during a moratorium.